

CLAIMS

1. A support for substances for detection comprising a flexible base member formed to be slender like a thread, string or tape, a variety of substances for detection having predetermined chemical structure and being fixed side by side along the length of the base member, and a supporting member for supporting the base member in a manner that enables expansion, wherein a fixed location of each substance for detection corresponds with the chemical structure thereof.
2. A support for substances for detection according to claim 1, wherein one or more marks are provided on said base member to indicate a reference position.
3. A support for substances for detection according to claim 1 or claim 2, wherein said base member is supported by said supporting member, while being enclosed in a defined area so that said base member can contact with a liquid, and can be expanded from the area.
4. A support for substances for detection according to claim 1 or claim 2, wherein said supporting member comprises a reel, and said reel comprises a core on which said base member is wound, and two guide frames mounted on opposite ends of said core facing one another and through which a liquid can pass.
5. A support for substances for detection according to claim 1 or claim 2, wherein said supporting member comprises a frame body, and a feed support section mounted on said frame body for supporting said base member in a manner that enables feeding, and said base member is supported by said feed support section so as to be able to travel along a defined feed pathway.
6. A support for substances for detection according to claim 5, wherein said feed support section comprises a drum rotatably mounted on said frame body and threaded around a periphery thereof, and said frame body has an arm for enabling said base member to be inserted into a vessel outside of said support for substances for detection, and said base member is wound along a bottom of the thread of said drum and can be moved in the neighborhood of a tip end of said arm by rotating said drum.

7. A support for substances for detection according to claim 5, wherein said feed support section comprises a supply reel and a take-up reel having a core around which said base member can be wound, and two guide frames through which liquid can pass mounted on opposite ends of said core, and said two reels are rotatably mounted on said frame body, and said frame body has an arm for enabling said base member to be inserted into a vessel outside of said support for substances for detection, and said base member is routed between two reels so as to pass around the tip end of said arm.

8. A support for substances for detection, according to claim 7, wherein said frame body comprises a casing, and an arm outwardly extending from said casing, and said take-up reel is rotatably mounted on said casing, and said supply reel is rotatably mounted on the tip end section of said arm.

9. A support for substances for detection according to claim 5, wherein said feed support section comprises one or more rollers rotatably mounted on said frame body along said feed pathway.

10. A support for substances for detection according to claim 9, comprising a protection belt sandwiched between said roller and said base member at the periphery of said roller, that travels at a predetermined feed velocity.

11. A support for substances for detection according to claim 5, comprising a detection region and/or a reaction region, on said feed pathway of said base member, wherein said detection region is one where substances for detection are detected, and said reaction region is one where the reaction between the substances for detection and the target substances is carried out.

12. A support for substances for detection according to claim 5, wherein said feed pathway of said base member forms a loop.

13. A support for substances for detection according to claim 5, wherein said feed support section comprises a coupling for connecting with an outer feed mechanism for feeding said base member.

14. A support for substances for detection according to claim 3, wherein said supporting member is made of a permeable material having a plurality of pores.

15. A support for substances for detection according to claim 13, wherein said supporting member comprises a spacer member for generating a space around said base member when said base member is integrated and supported.

16. A support for substances for detection according to claim 15, wherein said spacer member comprises detachable spacer pins provided so as to pierce through holes in one guide frame, pass near an outer periphery of said core and reach the other guide frame.

17. An apparatus for processing a support for substances for detection, comprising a plurality of processing regions for carrying out various processes for reaction or detection of a support for substances for detection, an installing section for installing said support for substances for detection in a manner that enables dismounting, transfer means for transferring said substances for detection between said processing regions, with said support for substances for detection installed in said installing section, and a control section for controlling so as to transfer said substances for detection in a predetermined order and in a predetermined timing.

18. An apparatus for processing a support for substances for detection according to claim 17, wherein said transfer means transfers said substances for detection, together with said installing means.

19. An apparatus for processing a support for substances for detection according to claim 18, wherein said installing section comprises a container for holding said support for substances for detection, and said container is communicated with a small diameter section capable of being inserted into a processing region such as a vessel, and is detachably mounted in a dispensing device comprising a drawing/discharging mechanism capable of adjusting the pressure in said container.

20. An apparatus for processing a support for substances for detection according to claim 17, wherein said installing section installs said support for substances for detection so that said base member supported on said feed support section of said supporting member can be fed, and said transfer means transfers substances for detection between said processing regions, by feeding only said base member in the direction of the length, with said feed support section installed in said installing section.

21. An apparatus for processing a support for substances for detection according to claim 20, wherein said transfer means comprises a feed mechanism connected to said feed support section of said support for substances for detection for feeding said base member.

22. An apparatus for processing a support for substances for detection according to claim 17, wherein said installing section installs said supporting member of said support for substances for detection and said transfer means comprises inter-region transfer means for transferring said supporting member between said processing regions together with said installing section, and a feed mechanism for feeding only said base member in the direction of the length with said supporting member installed in said installing section, and connected to said feed support section, and said substances for detection are transferred between processing regions, by using said inter-region transfer means and said feed mechanism.

23. An apparatus for processing a support for substances for detection according to claims 17, 18, 19, 20, 21 or 22, wherein vessels accommodating a variety of liquid are provided in said processing regions.

24. An apparatus for processing a support for substances for detection according to claim 23, wherein thermostatic control means for controlling temperature in one or more vessels is installed in one or more vessels.

25. An apparatus for processing a support for substances for detection according to claim 24, further comprising vibrating means for vibrating said vessel or said support for substances for detection in said vessel.

26. An apparatus for processing a support for substances for detection according to claim 23, wherein one or more vessels accommodate a cleaning liquid.

27. An apparatus for processing a support for substances for detection according to claim 23, comprising drying means for drying said support for substances for detection, in one of said processing regions.

28. An apparatus for processing a support for substances for detection according to claims 17, 18, 19, 20, 21 or 22, further comprising detection means for detecting a change in said support for substances for detection.

29. An apparatus for processing a support for substances for detection according to claims 17, 18, 19, 20, 21, or 22, further comprising an analyzer for automatically designating relevant substances for detection on the basis of locations on said base member where a change such as light emission generated by a reaction with a suspension incorporating target substances is detected, and analyzing or examining a structure of the target substances on the basis of a structure or characteristics of said substances for detection.

30. A method of processing a support for substances for detection, comprising the steps of:
installing a support for substances for detection in an installing section in a way that enables dismounting,

transferring substances for detection between a plurality of processing regions for processes of reaction or detection, and

processing said support for substances for detection in each processing region,

and a series of processes for said substances for detection are carried out by repeating said transferring step and said processing step.

31. Method of processing a support for substances for detection according to claim 30, wherein said substances for detection are transferred together with said installing section, at said

transferring step:

32. A method of processing a support for substances for detection according to claim 30, wherein at said transferring step said support for substances for detection is transferred together with an installing section, with said support installed into said installing section, and said installing section comprises a container for holding said support for substances for detection, and said container is communicated with a small diameter section capable of being inserted into a processing region such as a vessel, and is detachably mounted in a dispensing device comprising a drawing/discharging mechanism capable of adjusting the pressure in said container.

33. A method of processing a support for substances for detection according to claim 30, wherein at said installing step said support for substances for detection is installed so that said base member supported on said feed support section of said support for substances for detection can be fed, and at said transferring step said substances for detection are transferred between processing regions by feeding only said base member in the direction of the length thereof with said support for substances for detection installed in said installing section.

34. A method of processing a support for substances for detection according to claim 33, wherein at said transfer step said base member of said support for substances for detection is fed in a direction of the length of said base member, and said substances for detection are transferred between said processing regions, by connecting the feed support section to the feed mechanism and feeding.

35. A method of processing a support for substances for detection according to claim 33, wherein at said transferring step said supporting member of said support for substances for detection is transferred together with said installing section between said processing regions, and is rotated by connecting to said feed mechanism and only said base member is fed in a direction of the length, so that said substances for detection are transferred between said processing regions.

36. A method of processing a support for substances for detection according to claims 31, 32, 33, 34, or 35, wherein said processes in said processing regions are carried out in respective

vessels accommodating a variety of liquid.

37. A method of processing a support for substances for detection according to claims 31, 32, 33, 34, or 35, wherein said processing step comprises a temperature control step for controlling temperature in said vessels.

38. A method of processing a support for substances for detection according to claims 31, 32, 33, 34, or 35, wherein said processing step comprises a vibrating step for vibrating said vessel or said support for substances for detection.

39. A method of processing a support for substances for detection according to claims 31, 32, 33, 34, or 35, wherein said processing step comprises a drying step for drying said support for substances for detection to improve accuracy of detecting light emission.

40. A method of processing a support for substances for detection according to claims 31, 32, 33, 34, or 35, wherein said processing step comprises a reacting step for reacting a suspension incorporating target substances with said substances for detection, and a detecting step for detecting a change such as light emission in said support for substances for detection, and further comprises an analyzing step for designating a relevant substance for detection on the basis of detected locations of the substances for detection on said base member, and analyzing a structure of a target substance on the basis of the structure of said substances for detection.

41. A method of processing a support for substances for detection according to claim 40, wherein said detection step is carried out with said base member supported on said supporting member, in a state with said base member expanded, or in a state with said base member being fed.

42. An apparatus for making a support for substances for detection comprising,

a dispensing device having one or more conduits and drawing/discharging means for adjusting a pressure in said conduits,

a regeneration section for cleaning or exchanging said conduits,

a vessel having a plurality of liquid containing portions accommodating suspensions incorporating a variety of substances for detection and into which said conduit can be inserted,

a stage for arranging and stretching in parallel one or more base members which is to be dispensed, spotted, painted, or imprinted with liquid from said dispensing device,

a displacement device which enables the movement of said conduits relative to said regeneration section, said vessels, said stage and said base member, and

a control section for controlling said displacement device and said drawing/discharging means,

and said control section controls in a manner that positions each suspension on one or more base members, in substantially perpendicular directions to the length of the base member, along thin parallel lines, while keeping the lines from contact with neighboring lines, by repeating drawing, discharging, and displacement of each suspension incorporating the substances for detection, and cleaning or exchanging said conduits.

43. An apparatus for making a support for substances for detection comprising,

a printing device having one or more conduits, one or more reservoirs accommodating suspensions incorporating various substances for detection and communicated with said conduits, and discharging means for discharging a suspension by adjusting a pressure within said conduits or reservoirs,

a regeneration section for cleaning or exchanging said conduits and reservoirs,

a stage for arranging and stretching one or more base members to be printed by said printing device,

a displacement device which enables the movement of said conduits relative to said regeneration section, said vessels, said stage and said base member, and

a control section for controlling said displacement device and said discharging means,

wherein said control section controls in a manner that positions each suspension, on one or more base members, in a substantially perpendicular direction to the length of said base member, along thin parallel lines, keeping each line from contact with the other lines, by repeating discharging and displacement of the suspensions incorporating substances for detection, and cleaning or exchanging said conduits.

44. An apparatus for making a support for substances for detection comprising,

one or more liquid retention tips such as a grooved needle, a pipe, a pen nib, or a linear imprinting part,

a regeneration section for cleaning or exchanging said liquid retention tip,

a vessel having a plurality of liquid containing portions accommodating suspensions incorporating a variety of substances for detection and into which said liquid retention tip can be inserted,

a stage for arranging and stretching in parallel one or more base members to be painted, written, stained, or imprinted by said liquid retention tip,

a displacement device which enables the movement of said liquid retention tip relative to said regeneration section, said vessels, said base member, and said stage, and

a control section for controlling said displacement device,

wherein said control section controls in a manner that positions each suspension, on one or more base members, in a substantially perpendicular direction to the length of the base member,

along thin parallel lines, while keeping each line from contact with the other lines, by repeating holding and displacement of each suspension incorporating the substances for detection, and cleaning or exchanging said liquid retention tip.

45. An apparatus for making a support for substances for detection according to claims 42, 43, or 44, wherein said control section controls said conduits or said liquid retention tip drawing, holding or storing a particular type of suspension, so as to position each suspension incorporating a substance for detection, along a parallel line while keeping each line from contact with the other lines, by repeating in order dispensing, painting, imprinting, staining, writing, or printing of each type of suspension along lines in a direction perpendicular to the length of said base member from a fixed location where one or more base members are mounted in parallel, and exchanging or cleaning said conduit or liquid retention tip by said regeneration section, until all types of different suspensions are completed, for each position moved incrementally from said fixed location.

46. A method of making a support for substances for detection, comprising the steps of: arranging and stretching one or more base members in parallel on a plane, positioning each substance for detection on said base members by dispensing, painting, staining, imprinting, writing or printing each suspension respectively incorporating a variety of substances for detection in many parallel thin lines, while keeping each line from contact with the other lines, and supporting said base members fixed with the substances for detection on a supporting member, wherein a fixed location of said substance for detection corresponds with the chemical structure thereof.

47. A method of making a support for substances for detection according to claim 46, wherein said positioning step repeats in order;

a step for drawing or holding a suspension incorporating a particular type of substance for detection by moving to and inserting a conduit or a liquid retention tip into a vessel accommodating the suspension,

a step for dispensing, painting, staining, imprinting, or writing the suspension in a direction substantially perpendicular to the length of the base member while displacing said conduit or said liquid retention tip from a predetermined location of said base member, and

a regeneration step for cleaning or exchanging said conduit or liquid retention tip,

so that each suspension incorporating substances for detection, is positioned in parallel lines while keeping each line from contacting the other lines.

48. A method of making a support for substances for detection according to claim 46, wherein said positioning step repeats in order;

a step for printing a suspension incorporating a particular type of substance for detection by displacing a conduit communicated with a reservoir accommodating the suspension, while displacing the conduit from a predetermined location of said base member in a direction substantially perpendicular to the length of said base member, and

a regeneration step for cleaning or exchanging said conduit and reservoir,

so that each suspension incorporating substance for detection, is positioned in parallel lines while keeping each line from contacting with the other lines.